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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,280	03/24/2004	Yoshitaka Sasaki	119199	4031

25944 7590 09/28/2006

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EXAMINER
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TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/807,280

Applicant(s)

SASAKI ET AL.

Examiner

A. Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. The applicant(s) amendment filed on July 13, 2006 has been fully considered and made of record.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Objections***

3. Claim 1 is objected to because of the following informalities: a comma --,-- should be inserted after "gap layer" (line 10). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daby et al 6,683,749 in view of Liu et al 6,524,491.

Daby discloses a method of manufacturing a thin-film magnetic head comprising: forming a first magnetic pole layer (e.g. 12, in Fig. 12A); removing both sides in a track width direction of the first magnetic pole layer so as to leave a predetermined residual area in the first magnetic pole layer (see Figs. 12B and 12C); forming an insulating layer (e.g. 44 in Figs. 14A-14C) about the residual area of the first magnetic pole layer; forming a gap layer (e.g. 16 in Fig. 15C) made of a nonmagnetic material (e.g. alumina) on the residual area of the first magnetic pole layer and the insulating layer; forming on the gap layer, a second magnetic pole (e.g. 14)

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magnetically connected to the first magnetic pole; and patterning the second magnetic pole layer by etching while using a mask (col. 8, lines 37-44).

Regarding Claim(s) 2, Daby further teaches that the insulating layer 16 is formed of alumina, which is the chemical formula of  $\text{Al}_2\text{O}_3$ . As extrinsic evidence, the examiner cites Sasaki (U. S. Patent 6,278,580) to show that *alumina* has the chemical formula of  $\text{Al}_2\text{O}_3$  (see col. 2, lines 20-21).

Daby does not teach that within the step of patterning, a width of the second magnetic pole layer in the track width direction is smaller than that of the residual area (as required at the last 3 lines of Claim 1).

Liu teaches a patterning method that includes patterning a second magnetic pole layer (e.g. UP in sequence of Figs. 1H to 1I) using a mask (col. 9, lines 6+) such that a width of the second magnetic pole layer (e.g. UP in Fig. 1I) in the track width direction is smaller than that of the residual area in the first magnetic pole layer (e.g. S2A in Fig. 1I).

First, Daby et al and Liu et al each form an art recognized equivalent thin-film magnetic head having a track width.

Second, the benefits of Liu's patterning method of the second magnetic pole layer to such a width provides a thin-film magnetic head that reduces edge erasure from adjacent track writing during operation of the magnetic head (col. 1, lines 61+).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Daby by utilizing the patterning method of Liu, to manufacture an art recognized equivalent thin-film magnetic head, and to provide the benefits of reducing edge erasure from adjacent track writing during operation.

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5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daby et al in view Liu et al, as applied to Claim 1 above, and further in view of Schultz et al 5,640,753.

Daby, as modified by Liu, discloses the claimed manufacturing method as relied upon above in Claim 1. The modified Daby method does not mention that the residual area is 2.0  $\mu\text{m}$  in the track width direction.

Schultz suggests that magnetic heads having a width (e.g. track width) of a residual area in the first magnetic pole can be 2.0  $\mu\text{m}$  (col. 5, lines 20-26) for the purpose of achieving the very same magnetic recording characteristics. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the width of the residual area of Daby in the first magnetic pole layer, to the specific width taught by Schultz (e.g. 2.0  $\mu\text{m}$ ), to positively achieve the same magnetic recording characteristics of the magnetic head.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daby et al in view Liu et al, as applied to Claim 1 above, and further in view of Sasaki 6,278,580.

Daby, as modified by Liu, discloses the claimed manufacturing method as relied upon above in Claim 1, further including that the insulating layer (e.g. 44 in Daby) is formed on both sides in the track width direction of the residual area. The modified Daby method does not mention that the first magnetic pole layer is constructed by laminating a plurality of magnetic layers where the topmost layer is formed with the residual area.

Sasaki shows that a first magnetic pole layer can be constructed by laminating two magnetic layers (bottom pole chip 41 and bottom pole 26 in Fig. 18B) where a residual area is formed in the topmost magnetic layer (e.g. 41). One such advantage in forming the first magnetic pole layer by laminating at least two magnetic layers is that this allows a

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manufacturing method that has excellent characteristics in good liability and efficiency (col. 5, lines 4-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the first magnetic pole layer of Daby by forming the first magnetic pole layer by laminating two magnetic layers where the topmost magnetic layer forms the residual area, as taught by Sasaki, to advantageously provide a manufacturing method that has excellent characteristics and good liability and efficiency.

#### *Response to Arguments*

7. The applicant(s) arguments filed on July 13, 2006 have been fully considered, but are now met with respect to the reference cited to Liu et al, as the modification of Daby et al would be obvious in light of the teachings of Liu et al, for the reasons set forth above.

#### *Conclusion*

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

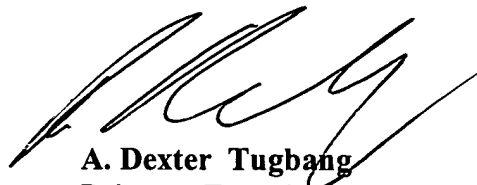
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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570. The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



**A. Dexter Tugbang**  
Primary Examiner  
Art Unit 3729

September 22, 2006